

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) An injection device comprising:
 - a housing having a proximate end and a distal end, the distal end having an opening therein;
 - a shield slideably coupled to the housing at said distal end thereof;
 - a cartridge barrel within the housing, the cartridge barrel having proximate and distal ends;
 - a needle cannula fixed to the distal end of the cartridge barrel, or attachment means for fixing a needle cannula to the distal end, said needle cannula being disposed within said shield prior to activation of said device;
 - a stopper within the cartridge barrel;
 - a driver coupled to the stopper;
 - a spring coupled between the housing and the driver;
 - an automatic driver trigger for retaining the driver fixed to the housing and in which state the spring is in a compressed state, the trigger being actuatable in use to automatically release the driver from the housing thereby allowing the spring to urge the driver through the housing and with it the stopper through the cartridge barrel; and

a release mechanism for releasing the spring from the driver at some point on its travel through the housing, whereupon the spring engages the shield and automatically urges the shield away from the housing so as to cover the needle cannula.

2. (Previously Presented) An injection device according to claim 1 and comprising means for allowing the driver to drive the cartridge barrel through the housing following activation of said driver trigger and prior to movement of the stopper through the cartridge barrel, thereby urging the needle cannula outward relative to the housing and shield.
3. (Previously Presented) An injection device according to claim 1, the driver trigger being coupled to said shield, wherein movement of the shield inwardly with respect to the housing activates the trigger.
4. (Previously Presented) An injection device according to claim 3, wherein said trigger is actuated prior to the emergence of the needle cannula from the shield.
5. (Previously Presented) An injection device according to claim 3, wherein said trigger is actuated subsequent to emergence of the needle cannula from the shield.
6. (Previously Presented) An injection device according to claim 1, wherein the driver trigger comprises a resilient member on one of the driver and the housing and a complimentary engaging member on the other of the driver and housing, and wherein said trigger is actuated by a force of sufficient magnitude applied between the driver and the housing.
7. (Previously Presented) An injection device according to claim 1, wherein said driver trigger comprises a resilient member on one of the driver and the housing and a complimentary engaging member on the other of the driver and housing, and wherein said trigger is arranged to

receive a trigger release member of the shield following movement of the shield into the housing.

8. (Previously Presented) An injection device according to claim 1, wherein said housing is generally cylindrical in shape and the spring and cartridge barrel are located coaxially within the housing.

9. (Currently Amended) An automatic injector for delivering a fluid, comprising:

a housing, said housing having a proximate end and a distal end;

a shield interfaced with the housing at a housing distal end and wherein said housing and said shield are arranged in a sliding relationship forming an enclosure;

a driver positioned within said enclosure and engaged to the housing and adapted to automatically disengage from the housing upon activation of said shield;

a cartridge positioned within said enclosure, and wherein said cartridge has a needle extending towards said shield, said needle being disposed within said shield prior to activation of said shield;

a barrel, said barrel arranged to contain a stopper and the fluid therein and wherein the fluid is in communication with said needle;

said driver slidably located within said housing for forcing the fluid through said needle upon activation of said injector; and

said driver further adapted to be biased by a driving unit, said driving unit causing said driver to slide towards said housing distal end and move a stopper

through said barrel to push the fluid through said needle for delivery into an injection site; and

wherein said shield is automatically deployed following fluid delivery so as to cover the needle.

10. (Original) The automatic injector of claim 9, wherein said shield displacement and driver disengagement require a substantial force over a short travel distance.
11. (Previously Presented) The automatic injector of claim 10, wherein said shield displacement and driver disengagement force required from the user is about 1 kgf.
12. (Previously Presented) The automatic injector of claim 10, wherein the driver disengagement from the housing takes place over the initial part of the shield travel.
13. (Previously Presented) The automatic injector of claim 9 wherein said force exerted by the automatic injector on the shield is minimal during delivery.
14. (Previously Presented) The automatic injector of claim 9, further comprising an automatic retracting mechanism that automatically retracts said shield after the completion of injection.
15. (Previously Presented) The automatic injector of claim 14, wherein said driver is arranged to allow the driving unit to force the retraction of the shield and shielding the needle at the end of delivery.
16. (Previously Presented) The automatic injector of claim 9 wherein said housing includes a set of supports extending longitudinally from a proximate end of the housing, said supports adapted to abut said cartridge barrel and prevent axial movement of said cartridge before, during and after operation of the automatic injector.

17. (Previously Presented) The automatic injector of claim 9, wherein said driver includes a set of cartridge barrel supports extending longitudinally and which slide on the external surface of the barrel during injection.
18. (Original) The automatic injector of claim 17, wherein said cartridge barrel supports are adapted to detect the end of barrel and release the driving unit.
19. (Previously Presented) The automatic injector of claim 9 wherein said driving unit is a spring arranged to bias said driver to push said stopper into said barrel and then move said shield into a needle shielding position.
20. (Previously Presented) The automatic injector of claim 19, wherein the released spring provides the user with a tactile and audible feedback of the end of delivery.
21. (Currently Amended) The automatic injector of claim 9 wherein said driver comprises protrusions that releasably engage said housing.
22. (Previously Presented) The automatic injector of claim 9 wherein said housing has an opening at said proximate end, said injector further comprising a rod extending through said opening and arranged to push said stopper into said barrel before activation of said injector.
23. (Previously Presented) The automatic injector of claim 22, wherein said rod has a smooth surface for axial movement in relation to said housing opening.
24. (Previously Presented) The automatic injector of claim 22, wherein said rod has a threaded section for rotational axial movement in relation to said housing opening.
25. (Previously Presented) The automatic injector of claim 23, wherein said rod has a serrated edge for incremental axial movement in relation to said housing opening.

26. (Previously Presented) The automatic injector of claim 9 further comprising a safety tab removably engaged with said enclosure, said tab arranged to prevent activation of said injector when said tab is engaged with said enclosure.

27. (Previously Presented) The automatic injector of claim 9 wherein said cartridge comprises a barrel having a closed distal end and a proximate end, said needle having a distal end for exposure to the injection site and a proximate end arranged to penetrate said closed distal end of the cartridge and providing fluid communication between the distal end of the needle and the interior of the cartridge, said proximate end of said cartridge arranged to accept said driver.

28. (Previously Presented) The automatic injector of claim 9 wherein said shield has an inner circumferential wall and an outer circumferential wall, said housing having an inner circumferential wall and an outer circumferential wall, said housing and said shield arranged in a sliding relationship, said housing and said automatic injector having an arrangement for latching the shield in the needle shielding position.

29. (Previously Presented) The automatic injector of claim 28, wherein said enclosure further comprises a leaf spring at said distal end of the enclosure, said leaf spring arranged to abut said driving unit after retraction of said shield and prevent potential re-exposure of said needle.

30. (Previously Presented) The automatic injector of claim 28, wherein said enclosure further comprises pins and pattern arranged at said distal end of enclosure, said pins and pattern arranged to interact during the use of the automatic injector and prevent potential re-exposure of said needle.

31. (Previously Presented) The automatic injector of claim 21, wherein said activation of said injector occurs after application of the axial pressure on the housing of the injector; said shield

moving to expose the needle and to separate said protrusions from said housing to allow axial movement of said driver and said stopper in said barrel, holding said injector at the injection site for the during of the injection.

32. (Currently Amended) The automatic injector of claim 28, wherein said housing and shield further include a window arranged to allow viewing of the barrel, ~~the~~ a barrel scale and the fluid in the barrel.

33. (Previously Presented) The automatic injector of claim 32, wherein said housing and said shield further have two matching slots in conjunction forming the window.

34. (Previously Presented) The automatic injector of claim 32, wherein said housing and said shield further have two matching openings in conjunction forming the window.

35. (Previously Presented) The automatic injector of claim 28, wherein said shield outer circumferential wall are arranged in a sliding relationship with said housing inner circumferential wall.

36. (Previously Presented) The automatic injector of claim 28, wherein said shield inner circumferential wall are arranged in a sliding relationship with said housing outer circumferential wall.

37. (Previously Presented) The automatic injector of claim 33, wherein said housing further has an extended section enveloping said shield and providing improved holding ability for the user.

38. (Currently Amended) An automatic injector for delivering a fluid comprising:
a housing, said housing having a proximate end and a distal end;

a shield interfaced with the housing at a housing distal end, wherein said housing and said shield are arranged in a sliding relationship forming an enclosure;

a driver positioned within said enclosure and engaged to the housing and adapted to automatically disengage from the housing upon activation of the shield;

a cartridge positioned within said enclosure, said cartridge having a needle extending towards said shield, said needle being disposed within said shield prior to activation of said injector;

a barrel, said barrel arranged to contain a stopper and the fluid therein, the fluid in communication with said needle;

a rod arranged to communicate with said stopper before the activation, said rod arranged to move said stopper for titration before the activation and to automatically separate from said stopper upon activation;

said driver being slidably located within said housing for forcing the fluid through said needle upon activation of said injector;

said driver further adapted to be biased by a driving unit and said driving unit causing said driver to slide towards said distal end and move said stopper through said barrel to push the fluid through said needle for delivery into an injection site; and

wherein said shield is automatically deployed following fluid delivery delivery so as to cover the needle.

39. (Previously Presented) The automatic injector of claim 38, wherein said housing has an aperture on the proximate end, said rod arranged to extend into said aperture during communication with said stopper and move said stopper during titration.

40. (Previously Presented) The automatic injector of claim 39, wherein said rod has a section for axial movement in relation to said housing opening.

41. (Previously Presented) The automatic injector of claim 39, wherein said rod has a threaded section for rotational axial movement in relation to said housing opening.

42. (Previously Presented) The automatic injector of claim 39, wherein said rod has a serrated edge for incremental axial movement in relation to said housing opening.

43. (Previously Presented) The automatic injector of claim 38, wherein said injector further includes a window arranged to allow viewing of the cartridge fluid.

44. (Previously Presented) An injector for automatically injecting and delivering fluids into a living being, said injector comprising:

a housing having a first proximal end and a first distal end that is open;

a cartridge having a barrel containing a fluid, said cartridge further comprising a displaceable stopper at a second proximal end and a needle at a second distal end, said cartridge being fixed within said housing;

a driver engaged within said housing for driving said stopper to dispense the fluid from said barrel and through said needle when disengaged from said housing;

a needle shield being in sliding engagement with said first distal end of said housing and comprising an opening for permitting said needle to pass therethrough, said needle being disposed within said needle shield prior to activation of said injector; and

a single spring, engaged with said driver, that is released by a user force, said single spring displacing said driver for automatically injecting and delivering the fluid into the living being and for automatically acting against the needle

shield to remove the needle from the living being while automatically concealing the needle within said shield once the fluid delivery is complete.

45. (Currently Amended) An automatic injector for delivering a fluid, comprising:

a housing, said housing having a proximate end and a distal end;

a shield interfaced with the housing;

said housing and said shield arranged in a sliding relationship forming an enclosure;

said driver positioned within said enclosure;

a cartridge positioned within said enclosure, said cartridge having a needle extending towards said shield, said needle being disposed within said shield prior to activation of said injector;

a cartridge barrel, said barrel arranged to contain a stopper and the fluid therein, the fluid in communication with said needle, said driver slidably located within said housing for moving the needle forward to insert it into tissue and for forcing the fluid through said needle upon activation of said injector;

a driver attached to the housing and adapted to automatically disengage from the housing upon activation of the injector;

said driver further adapted to be biased by a driving unit and said driving unit causing said driver to slide towards said distal end to forward the cartridge with the needle and move said stopper through said barrel to push the fluid through said needle and deliver fluid into an injection site; and

wherein said shield is automatically deployed following fluid delivery so as to cover the needle.

46. (Original) The automatic injector of claim 45, wherein said shield displacement requires a substantial force over a short travel distance.
47. (Original) The automatic injector of claim 46, wherein the shield displacement force is sufficient to ensure rapid housing and shield disengagement.
48. (Original) The automatic injector of claim 45, wherein said the force exerted by the shield of the automatic injector on the tissue is minimal during delivery.
49. (Original) The automatic injector of claim 48, wherein the shield and the housing have latches maintaining the relative housing to shield position during delivery.
50. (Original) The automatic injector of claim 45, wherein the force exerted by the automatic injector moves the cartridge toward the distal end of the automatic injector to insert the needle into tissue and deliver the drug.
51. (Original) The automatic injector of claim 45, further comprising a mechanism that automatically retracts said shield and shields the needle after the completion of injection

52. (Previously Presented) The automatic injector of claim 51, wherein said driver is arranged to allow the driving unit to force the shield in the distal direction and shield the needle at the end of delivery.

53. (Previously Presented) The automatic injector of claim 45, wherein said housing includes a support extending longitudinally from said proximate end of the housing, said support adapted to abut said cartridge barrel and prevent axial movement of said cartridge before use.

54. (Original) The automatic injector of claim 45, wherein said shield includes protrusions extending longitudinally from the distal end and limiting cartridge motion toward the distal end of the injector after activation.

55. (Original) The automatic injector of claim 45, wherein said driver includes a set of cartridge barrel supports extending longitudinally and sliding on the external surface of the barrel during injection.

56. (Original) The automatic injector of claim 55, wherein said cartridge barrel supports are adapted to detect the end of barrel and release the shield.

57. (Original) The automatic injector of claim 55, wherein said driver has protrusions supporting the barrel from axial motion toward the distal end of the automatic injector after injection completion.

58. (Original) The automatic injector of claim 45, wherein said driving unit is a spring arranged to bias said driver to push said cartridge to insert the needle into tissue, to push said stopper into said barrel and then move said shield into needle shielding position.

59. (Previously Presented) The automatic injector of claim 58, wherein said released spring provides the user with a tactile and audible feedback of the end of delivery.

60. (Currently Amended) The automatic injector of claim 45, wherein said driver comprises protrusions, said driver protrusions releasably engaging said housing.
61. (Currently Amended) The automatic injector of claim 60, said activation of said injector occurs after application of an axial force on the shield of the injector; said shield moving to separate said driver protrusions from said housing to allow fluid delivery while ~~and said holding~~ said injector at the injection site for the duration of the injection.
62. (Previously Presented) The automatic injector of claim 45, wherein said cartridge comprises a barrel having a closed distal end and a proximate end, said needle having a distal end for exposure to the injection site and a proximate end arranged to penetrate said closed distal end of the cartridge and provide fluid communication between the distal end of the needle and the interior of the cartridge, said proximate end of said cartridge arranged to accept said driver.
63. (Previously Presented) The automatic injector of claim 45, wherein said shield has an inner circumferential wall and an outer circumferential wall, said housing having an inner circumferential wall and an outer circumferential wall, said housing and said shield arranged in a sliding relationship, and said automatic injector having arrangements for latching the shield to the housing.
64. (Previously Presented) The automatic injector of claim 63, wherein said shield further comprises a hook at said distal end and the housing comprising matching windows at distal end of said housing for engaging the shield and housing in storage and delivery positions.
65. (Previously Presented) The automatic injector of claim 63, wherein said shield further comprises a leaf spring said leaf spring arranged to abut said driving unit after retraction of said shield and prevent potential re-exposure of said needle.

66. (Original) The automatic injector of claim 45, further comprising a safety tab remove-ably engaged with said enclosure, said tab arranged to prevent activation of said injector when said tab is engaged with said enclosure.

67. (Previously Presented) The automatic injector of claim 63, wherein said housing and shield further include a window arranged to allow viewing of the barrel, a barrel scale and the fluid in the barrel.

68. (Previously Presented) The automatic injector of claim 67, wherein said housing and said shield further include matching openings across diameter in conjunction forming the window.

69. (Original) The automatic injector of claim 45, wherein said injector is equipped with a safety tab said shield proximate displacement requires the removal of the safety tab.

70. (Previously Presented) The automatic injector of claim 45, wherein said injector is equipped with a needle cover assembly cup, said shield displacement requires the removal of the cup together with the needle cover assembly.